

REMARKS

Applicants have studied the Office Action dated November 5, 2003 and have made amendments to the claims. It is submitted that the application, as amended, is in condition for allowance. By virtue of this amendment, claims 41-52 are pending. Claims 20-39 have been canceled without prejudice or disclaimer in response to a previous restriction requirement. Claims 1-19 and 40 have been canceled without prejudice or disclaimer in this response. Reconsideration and allowance of the pending claims in view of the above amendments and the following remarks are respectfully requested.

In the Office Action, the Examiner:

- Accepted the response to the restriction requirement;
- Rejected claims 1-19 under 35 U.S.C. §112, second paragraph, as being indefinite; and
- Rejected claims 1-19 under 35 U.S.C. §103(a) as being unpatentable over Stumm (U.S. 5,768,528) in view of Miller (U.S. 5,878,228).

Overview of the present invention

Preferred Embodiments of the present invention provide an improved apparatus, computer program product and method for efficiently handling requests for files and other data downloads from a server of a network. The present invention makes use of a proxy server application residing on a separate proxy server or as part of a file server. The proxy server application sends a corresponding client applet to the client application to monitor and coordinate the download process. The present invention allows a threshold time value to be set by the requesting client applet and/or by the proxy server application depending on which embodiment is implemented. In the embodiment where the threshold is sent by the requesting client application, the proxy server application can differentiate requests that do not need to be handled during times of peak congestion.

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In the embodiment, where the threshold is predetermined at the proxy server, a determination is made of the utilization load of the file server. In the event the utilization load is below the predetermined threshold, the file is downloaded to the client from the file server. In the case where the utilization load exceeds the predetermined threshold an estimated start-time to download the file is calculated and returned to the client applet along with an estimated time to complete the download. In one embodiment, the number of other pending download requests is also returned to the client applet to provide further status. The estimated start-time is based upon a number of outstanding bytes still to be downloaded from the file server and an available bandwidth of the network. This provides accurate feedback to the client applet of the status of the pending request. The applet sent to client application is a small program that can be sent along with a Web page to a client application such as a web browser. This applet is typically written as a Java applet which manages and provides status from the proxy server application on the progress of the download request.

In one embodiment where the threshold is set depending on the file size, large file sizes are not given high priority for downloads in order to reduce server load during business hours.

In another embodiment where the threshold is set depending on the file type, e.g. html file types are typically smaller than wave (.wav) file types and are provided higher priority in downloads.

The client applet periodically requests status from the proxy server application and depending on the status of the request i.e. whether it is "pending scheduling" or "pending download", a request is dispatched for the file requested for download to the client. Further, requests from the exact data or file will result in one download from the file server rather than multiple downloads, because each new request received by the proxy application is searched against a request response database and all the identical requests are grouped into a single request to the file server.

The present invention provides a more efficient use of finite available bandwidth through the proxy server application in multiple ways. First, the proxy server application accepts a threshold time from the client applet for performing the download which can be desirably set to off peak, non-business hours, when the traffic through the proxy server is greatly reduced.

Second, the present invention uses file server and bandwidth resources more efficiently by grouping multiple requests for the same resource results in one download from the designated source file server rather than multiple redundant downloads. This reduces load on the file server and saves bandwidth.

Third, the present invention uses file server and bandwidth resources more efficiently by providing the user of the client applet accurate feedback of not only when a download is scheduled to begin, but also when the download will complete and how many other download requests are pending. This provides the user a more complete picture of the status of the download request.

Fourth, the present invention uses file server and bandwidth resources more efficiently by scheduling larger file sizes during non-peak times, i.e. after business hours.

Fifth, the present invention uses file server and bandwidth resources more efficiently by scheduling certain file types for downloads during non-peak times, i.e. after business hours.

In order to more particularly point out this feature of a proxy server applet coordinating with a client applet the download of requested files and data from a file server to a client system, the following language has been added to the independent claims, i.e., claims 41, 42, 47 and 52 as follows:

- Claim 41

- determine if a utilization load of the file server exceeds a predetermined threshold, and in response to the utilization load exceeding the predetermined threshold, calculating an estimated start-time to begin a download of the data

requested from the file server to the client computer, and store the estimated start-time along with an identifier for the data requested, wherein the estimated start-time is based upon a number of outstanding bytes still to be downloaded from the file server and an available bandwidth of the network;

send a client side applet to the client computer in response to the data requested, and

send the client side applet status information regarding the data requested for download from the file server, including the estimated start-time to download the data requested, and an estimated time to complete the download of the data requested, and a count of other pending download requests received by the file server.

- Claims 42 and 47

determining if a utilization load of the file server exceeds a predetermined threshold, and in response to the utilization load exceeding the predetermined threshold, calculating an estimated start-time to begin a download of the information resource requested from the file server to the client computer, and store the estimated start-time along with an identifier for the information resource requested in the database, wherein the estimated start-time is based upon a number of outstanding bytes still to be downloaded from the file server and an available bandwidth of the network; and

sending status information for the information resource requested to the applet including the estimated start-time to download the information resource along with an estimated time to complete the download of the information resource;

- Claim 52

a schedule manager which for each download request received, compares the download request with previous request identifiers stored in the cached request database and in response to a match found in the cached database, changing the associated status identifier to indicate a match was found, wherein the schedule manager periodically compares a current proxy server application time to the threshold time recorded in the cached request database, and in response to the current proxy server time exceeding the

threshold time, the status identifier is changed to the download request;

a request manager which periodically compares the status identifier in the cached request database, and in response to the status identifier matching the download request, downloading the requested data file from the file server to the client.

Support for these newly added claims are found in the specification and drawings as originally filed, specifically on pages 6-21 and Figures 2-6. No new matter has been added.

Rejection Under 35 U.S.C. §112, Second Paragraph

As noted above, the Examiner rejected claims 1-19 under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 1-19 have been cancelled without prejudice or disclaimer. Newly added claims particularly point out and distinctly claim the subject matter of the present invention. Specifically, independent claims 41, 42, 47 and 52 disclose how a proxy server applet coordinating with a client applet, schedules the download of requested data and files from a file server to a client system. Further a status is sent from the proxy server application to the client applet, in the event where the utilization load of the file server exceeds the predetermined threshold. The status includes an estimated start-time to download the file along with an estimated time to complete the download. The estimated start-time is based upon a number of outstanding bytes still to be downloaded from the file server and an available bandwidth of the network. In light of the foregoing, the Applicants respectfully submit that the Examiner's rejection has been overcome and rendered moot. Accordingly, newly added claims 41-52 are in a condition for allowance which allowance is respectfully requested.

Rejection Under 35 U.S.C. §103(a)

As noted above, the Examiner rejected claims 1-19 under 35 U.S.C. §103(a) as being unpatentable over Stumm (U.S. 5,768,528) in view of Miller (U.S. 5,878,228). Claims 1-

19 have been cancelled without prejudice or disclaimer. Accordingly, the Applicants respectfully submit that the Examiner's rejection has been rendered moot.

Continuing further, newly added independent claims 41, 42, 47, and 52 distinguish over Stumm taken alone and/or in view of Miller. To begin, the present invention provides two pieces of software to coordinate downloads. A proxy server application and a client side applet both work in conjunction with a client side application such as a web browser. The proxy server application acts as an intermediary between the client applet and the file server to manage and schedule downloads. Accurate status of the download request is sent to the client applet from the proxy server application which includes the estimated download time. The estimated start-time is based upon a number of outstanding bytes still to be downloaded from the file server and an available bandwidth of the network. Unlike many other prior art systems, the present invention provides an estimated download time. An estimated download time is different than a simple status bar showing percentage complete of a given download request. In the prior art system, it is not possible for the user to determine the download time from the status bar without more information e.g., download speed and total number of bytes to be downloaded.

Moreover, the present invention provides accurate status of the download in response to the periodic requests from the client applet. The accurate status is determined by the proxy server application including the estimated start-time of the download which is based upon a number of outstanding bytes still to be downloaded from the file server and an available bandwidth of the network

The Examiner recites 35 U.S.C. §103. The Statute expressly requires that obviousness or non-obviousness be determined for the claimed subject matter "as a whole," and the key to proper determination of the differences between the prior art and the present invention is giving full recognition to the invention "as a whole." The Stumm taken alone and/or in view of Miller simply does not suggest, teach or disclose the patentably distinct limitation of proxy server application and a client applet for managing downloads of files and data from a file server, where:

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determining if a utilization load of the file server exceeds a predetermined threshold, and in response to the utilization load exceeding the predetermined threshold, calculating an estimated start-time to begin a download of the information resource requested from the file server to the client computer, and store the estimated start-time along with an identifier for the information resource requested in the database, wherein the estimated start-time is based upon a number of outstanding bytes still to be downloaded from the file server and an available bandwidth of the network

and

sending status information for the information resource requested to the applet including the estimated start-time to download the information resource along with an estimated time to complete the download of the information resource;

For the foregoing reasons, independent claims 41, 42, 47 and 52 distinguish over Stumm taken alone and/or in view of Miller. Claims 43 - 46 and 48 - 51 depend from independent claims 42 and 47 respectively. Since dependent claims contain all the limitations of the independent claims, claims 43 - 46 and 48 - 51 distinguish over Stumm taken alone and/or in view of Miller, as well, and the Examiner's rejection should be withdrawn.

Continuing still further, Stumm taken alone and/or in view of Miller are silent on estimating a start-time for downloading a file based upon a file size and/or a file type as recited in claims 44, 49 and 45, 50. Accordingly, claims 44, 49 and 45, 50 distinguish over Stumm taken alone and/or in view of Miller for this reason as well.

CONCLUSION

The remaining cited references have been reviewed and are not believed to affect the patentability of the claims as amended. In this Response, Applicants have amended certain claims. In light of the Office Action, Applicants believe these amendments serve a useful clarification purpose, and are desirable for clarification purposes, independent of patentability. Accordingly, Applicants respectfully submit that the claim amendments do not limit the range of any permissible equivalents.

Applicants acknowledge the continuing duty of candor and good faith in the disclosure of information known to be material to the examination of this application. In accordance with 37 CFR §1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment is limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this amendment by the Applicants and their attorneys.

Applicants respectfully submit that all of the grounds for rejection stated in the Examiner's Office Action have been overcome, and that all claims in the application are allowable. No new matter has been added. It is believed that the application is now in condition for allowance, which allowance is respectfully requested.

PLEASE CALL the undersigned if that would expedite the prosecution of this application.

Respectfully submitted,

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